Qos Aware Routing in Vehicular Ad hoc Networks: A Survey

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ABSTRACT

Various applications such as road safety, comfort of passenger, entertainment, public safety, sign extension and intelligent transportation require the communication between the vehicles. Vehicular Ad hoc networks (VANETs) provide the communication such as Vehicle to Vehicle communication and Vehicle to Infrastructure communication. VANETs face many networking research challenges including quality of service (QoS), signal fading, scalability, bandwidth limitations, routing, mobility and security due to the highly mobile nature of vehicles and highly dynamic network topology. Various authors have proposed routing algorithms to address QoS research issue to provide reliable routes. The major drawbacks of such routing algorithms are its complexity, routing overheads and scalability. To overcome these limitations various optimization techniques such as Ant Colony Optimization, Bee Colony Optimization and are used to find the reliable route from source to the goal to consider various QoS constraints. In this paper, various QoS-aware routing protocols are categorized based on parameters such as reliability and availability, link lifetime, connectivity probability and stability. Based on observations, comparative analysis of various QoS-aware routing protocols is presented.

KEYWORDS
VANET; Routing; QoS; Ant Colony Optimization; Bee Colony Optimization.

INTRODUCTION

Due to the development of wireless technologies and short range communication technologies, VANETs are quite popular these days [1]. VANETs are the subset of mobile ad hoc networks (MANET) which consists of mobile nodes (vehicles) and fixed nodes (roadside units). In intelligent transportation system (ITS) vehicles play various roles such as source vehicle, destination vehicle and router to send the packets to other vehicles. The vehicles use the packet information to support various safety applications. On-BoardUnits (OBU) is present in vehicles which enables communication with other vehicles. Vehicles contain hardware such as Global Positioning Systems (GPS) which provides the detailed information about the location of the vehicles.

Vehicle to Vehicle Communication (V2V)
Communication between the different vehicles take place in this type of communication. Such communication (Figure.1) allows different vehicles to share the information with each other required by safety applications.

Figure 1 : Vehicle to Vehicle Communication